

Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference A41348A	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/JP2004/008790	International filing date (day/month/year) 16.06.2004	Priority date (day/month/year) 16.06.2003
International Patent Classification (IPC) or national classification and IPC		
Applicant RIKEN		

<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>7</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input checked="" type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s))</p> <p>1 flexible disk, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>	
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input checked="" type="checkbox"/> Box No. VIII Certain observations on the international application</p>	

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/JP	Authorized officer
Facsimile No.	Telephone No.

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

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Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language _____ which is the language of a translation furnished for the purposes of:

- ☐ international search (Rule 12.3 and 23.1(b))
☐ publication of the international application (Rule 12.4)
☐ international preliminary examination (Rule 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

☒ the international application as originally filed/furnished

☐ the description:

pages _____ as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☐ the claims:

nos. _____ as originally filed/furnished

nos.* _____ as amended (together with any statement) under Article 19

nos.* _____ received by this Authority on _____

nos.* _____ received by this Authority on _____

☐ the drawings:

sheets _____ as originally filed/furnished

sheets* _____ received by this Authority on _____

sheets* _____ received by this Authority on _____

☒ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing (*specify*): _____

☐ any table(s) related to sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages _____

☐ the claims, nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing (*specify*): _____

☐ any table(s) related to sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-22	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-22	NO
Industrial applicability (IA)	Claims	1-22	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

Document 1: WO 03/042401 A2 (Clontech Laboratories Inc.),
22 May 2003

Document 2: WO 03/033693 A1 (The Institute of Physical
and Chemical Research), 24 April 2003

Claims 1, 8 to 10 and 12 to 18

The inventions set forth in claims 1, 8 to 10 and 12 to 18 do not involve an inventive step in the light of document 1 cited in the international search report.

Document 1 discloses the fluorescent protein mcavGFP2, which comprises a 234 acid-long amino acid sequence that is derived from the species *Montastraea cavernosa* (refer to fig. 20, SEQ ID NO: 26), and a fluorescent protein mannFP, which comprises a 224 acid-long amino acid sequence that is derived from the species *Montastraea annularis* (refer to fig. 21, SEQ ID NO: 28), and said fluorescent proteins have a homology of 83% and 77%, respectively, in relation to the amino acid sequence of the fluorescent protein derived from the species *Favia fava*, which is represented by SEQ ID NO: 1 set forth in the present application.

However, the genus *Montastraea* and the genus *Favia* both belong to the same family (i.e. the family

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Faviidae); therefore, it can be considered to have been easy to clone the gene which codes the fluorescent protein that is represented by SEQ ID NO: 1 set forth in the present application by creating a degenerate primer or probe based on the sequence information that is disclosed in document 1 and then searching the cDNA library from the species *Favia fava*.

Claims 1, 8 to 10 and 12 to 18

The inventions set forth in claims 1, 8 to 10 and 12 to 18 do not involve an inventive step in the light of document 2 cited in the international search report.

Document 2 discloses a fluorescent protein, which comprises a 225 acid-long amino acid sequence that is derived from the species *Galaxea fascicularis* (refer to sequence 1), and said amino acid sequence has a homology of 76% in relation to the amino acid sequence of the fluorescent protein derived from the species *Favia fava*, which is represented by SEQ ID NO: 1 set forth in the present application.

However, the species *Galaxea fascicularis* and the species *Favia fava* belong to the same order (i.e. the order *scleractinia*); therefore, it can be considered to have been easy to clone the gene which codes the fluorescent protein that is represented by SEQ ID NO: 1 set forth in the present application by creating a degenerate primer or probe based on the sequence information that is disclosed in document 2 and then searching the cDNA library from the species *Favia fava*.

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement

Claims 2 to 8 and 11 to 22

The inventions set forth in claims 2 to 8 and 11 to 22 do not involve an inventive step in the light of documents 1 and 2 cited in the international search report.

Documents 1 and 2 indicate that it is possible to change the hue of the fluorescent light by modifying the amino acid sequence of the acquired fluorescent protein so as to change the green chromophore group.

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Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

With regards to the modified proteins obtained by modifying the fluorescent proteins that are set forth in claims 2 to 8 and 11 to 22, the present application does not present any experimental data confirming that said modified proteins exhibit a superior effect in comparison to the natural proteins that are represented by SEQ ID NO: 1; therefore, the modified proteins in question cannot be considered to be fully supported by the description.

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Supplemental Box Relating to Sequence Listing

Continuation of Box No. I, item 2:

1. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this report was established on the basis of:
- a. type of material
- ☒ a sequence listing
- ☐ table(s) related to the sequence listing
- b. format of material
- ☐ in written format
- ☒ in computer readable form
- c. time of filing/furnishing
- ☐ contained in the international application as filed
- ☒ filed together with the international application in computer readable form
- ☐ furnished subsequently to this Authority for the purposes of search and/or examination
- ☐ received by this Authority as an amendment* on _____
2. ☒ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
3. Additional comments:

* If item 4 in Box No. I applies, the listing and/or table(s) related thereto, which form part of the basis of the report, may be marked "superseded."